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WHAT IS CLAIMED IS:

- 1 1. A transmission control syst m for a hybrid vehicle,
2 comprising:
3 a hybrid transmission comprising a differential
4 mechanism which includes at least four rotating members,
5 rotating conditions of all of the rotating members being
6 determined when rotating conditions of two of the
7 rotating members are determined, four of the rotating
8 members being connected to one of two motor/generators,
9 an input connected to a prime mover, an output connected
10 to a driveline, and the other of the motor/generators,
11 the one of the motor/generators being controlled by means
12 of a revolution speed control to execute a transmission
13 ratio control, the other of the motor/generators being
14 controlled by means of a torque control to execute an
15 output control; and
16 a controller connected to the hybrid transmission
17 including the motor/generators, the controller being
18 arranged to change the torque control of the
19 motor/generator under the torque control to the
20 revolution speed control and to change the revolution
21 speed control of the other motor/generator under the
22 revolution speed control to the torque control, when one
23 of the torque of the motor/generator under the revolution
24 torque control and the revolution speed of the other
25 motor/generator under the torque control becomes
26 saturated.
- 1 2. The transmission control system as claimed in claim
2 1, wherein the motor/generators are connected to the
3 rotating members located at both outer sides on a lever
4 diagram indicative of the hybrid transmission, and the

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5 input connected to a prime mover and the output connected
6 to a driveline are connected to the rotating members
7 located between the rotating members connected to the
8 motor/generators on the lever diagram.

1 3. The transmission control system as claimed in claim
2 1, wherein the controller is further arranged to change
3 the revolution speed control of the motor/generator under
4 the revolution speed control to the torque control and to
5 change the torque control of the other motor/generator
6 under the torque control to the revolution speed control,
7 only when the torque of the motor/generator under the
8 revolution speed control becomes saturated.

1 4. The transmission control system as claimed in claim
2 3, wherein the controller sets a torque command of the
3 motor/generator to be changed from the revolution speed
4 control to the torque control so that an actual torque of
5 the motor/generator to be changed from the revolution
6 speed control to the torque control is smoothly varied
7 from an actual torque at a moment just before a
8 changeover from the revolution speed control to the
9 torque control to a target torque, and sets a revolution
10 speed command of the motor/generator to be changed from
11 the torque control to the revolution speed control is
12 smoothly varied from an actual revolution speed at a
13 moment just before a changeover from the torque control
14 to the revolution speed control to a target revolution
15 speed.

1 5. The transmission control system as claimed in claim
2 1, wherein the controller is further arranged to change

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3 the torque control of the motor/generator under the
4 torque control to the revolution speed control and to
5 change the revolution speed control of the other
6 motor/generator under the revolution speed control to the
7 torque control, only when the revolution speed of the
8 motor/generator under the torque control becomes
9 saturated.

1 6. The transmission control system as claimed in claim
2 5, wherein the controller sets a revolution speed command
3 of the motor/generator to be changed from the torque
4 control to the revolution speed control so that an actual
5 revolution speed of the motor/generator to be changed
6 from the torque control to the revolution speed control
7 is smoothly varied from an actual revolution speed at a
8 moment just before a changeover from the torque control
9 to the revolution speed control to a target revolution
10 speed, and sets a torque command of the motor/generator
11 to be changed from the revolution speed control to the
12 torque control is smoothly varied from an actual torque
13 at a moment just before a changeover from the revolution
14 speed control to the torque control to a target torque.

1 7. The transmission control system as claimed in claim
2 1, wherein the controller is further arranged to
3 determine whether the torque of the motor/generator under
4 the revolution speed control becomes saturated.

1 8. The transmission control system as claimed in claim
2 1, wherein the controller is further arranged to
3 determine whether the revolution speed of the

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4 motor/generator under the torque control becomes
5 saturated.

1 9. The transmission control system as claimed in claim
2 1, wherein the controller determines that the torque of
3 the motor/generator under the revolution torque control
4 becomes saturated when the torque detected by a torque
5 detector becomes out of a range between upper and lower
6 torque limits of the motor/generator

1 10. The transmission control system as claimed in claim
2 1, wherein the controller determines that the revolution
3 speed of the motor/generator under the torque control
4 becomes saturated when the revolution speed detected by a
5 revolution speed detector becomes out of a range between
6 upper and lower revolution speed limits of the
7 motor/generator.

1 11. The transmission control system as claimed in claim
2 1, further comprising revolution speed detectors for
3 detecting the revolution speeds of the motor/generators
4 and torque detectors for detecting the torques of the
5 motor/generators.

1 12. The transmission control system as claimed in claim
2 1, wherein the controller is further arranged to
3 determine a prime mover operating point indicative of a
4 combination of a revolution speed and a torque of the
5 prime mover according to a driver's demand so as to
6 maintain an optimal fuel consumption of the hybrid
7 vehicle.

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1 13. A method of controlling a hybrid transmission which
2 is for a hybrid vehicle and comprises a differential
3 mechanism including at least four rotating members,
4 rotating conditions of all of the rotating members being
5 determined when rotating conditions of two of the
6 rotating members are determined, four of the rotating
7 members being connected to one of two motor/generators,
8 an input connected to a prime mover, an output connected
9 to a driveline, and the other of the motor/generators,
10 the one of the motor/generators being controlled by means
11 of a revolution speed control to execute a continuous
12 variable transmission ratio control, the other of the
13 motor/generators being controlled by means of a torque
14 control to execute an output control, the method
15 comprising:
16 changing the torque control of the motor/generator under
17 the torque control to the revolution speed control and
18 changing the revolution speed control of the other
19 motor/generator under the revolution speed control to the
20 torque control, when one of the torque of the
21 motor/generator under the revolution torque control and
22 the revolution speed of the motor/generator under the
23 torque control becomes saturated.

1 14. A control system for controlling a hybrid
2 transmission applied to a hybrid vehicle, the hybrid
3 transmission comprising a differential mechanism which
4 includes at least four rotating members, rotating
5 conditions of all of the rotating members being
6 determined when rotating conditions of two of the
7 rotating members are determined, four of the rotating
8 members being connected to one of two motor/generators,

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9 an input connected to a prime mover, an output connected
10 to a driveline, and the other of the motor/generators,
11 the one of the motor/generators being controlled by means
12 of a revolution speed control to execute a transmission
13 ratio control, the other of the motor/generators being
14 controlled by means of a torque control to execute an
15 output control, the control system comprising:
16 means for changing the torque control of the
17 motor/generator under the torque control to the
18 revolution speed control and the revolution speed control
19 of the other motor/generator under the revolution speed
20 control to the torque control, when one of the torque of
21 the motor/generator under the revolution torque control
22 and the revolution speed of the other motor/generator
23 under the torque control becomes saturated.